

## **UPDATED PROJECT INFORMATION FOR COUNTIES PLANNING THE REGIONAL TRANSPORTATION IMPROVEMENT DISTRICT (RTID)**

Since February, WSDOT has intensified efforts on cost estimation for the state's largest transportation improvement projects, or "mega projects," included in the Referendum 51 project list. Some of these mega projects could be important parts of the Puget Sound area regional transportation package authorized under legislation passed last March.

This project cost information can be used as officials from King, Snohomish, and Pierce Counties develop 10-year financing and expenditure plans for a program to address some of the Puget Sound region's most significant transportation problems.

WSDOT and state and regional decision makers are aware of public concern and skepticism about the costs of large public projects and how costs just seem to grow and grow. WSDOT wants the public and decision makers to have the best possible information about the likely cost ranges of major transportation projects. The word "range" is important. We cannot wholly predict the future, but we can, with this cost estimating tool, better forecast the range of costs and time a project will require. And then we can more realistically plan for the best – and also the worst – possibilities.

WSDOT has developed the Cost Estimate Validation Process (CEVP) based on the latest cost estimating experience around the country and elsewhere in the world.

CEVP is an intense workshop process, somewhat resembling value engineering. Each project is examined by a team of top engineers from private firms, public agencies from around the country, risk managers, and WSDOT engineers. Many of the participants have had extensive first-hand experience in large project programming and delivery.

CEVP recognizes that every project cost estimate will be a mix of the very likely, the probable, and the maybe. Meeting the estimate of the number of yards and the cost of concrete to be poured for a roadway is pretty likely. It's probable that if the project is built five years from now, inflation will add 20-25% to "today's" project costs – but it would be a different ball game, and probably 15% higher cost, three years after that. And a big maybe – looking into the crystal ball – is whether contaminated soil would be encountered during construction requiring expensive cleanup costs.

The CEVP workshop uses systematic project review and risk assessment methods, including statistics and probability theory, to evaluate the quality of the information at hand and to identify and describe cost and schedule risks. Importantly, the process examines, from the very beginning, how risks can be lowered and cost vulnerabilities managed or reduced. In other words, a dividend of CEVP is to promote the activities that will improve end-of-project cost and schedule results.

CEVP will help communicate to the public the risks identified and their potential cost impacts – so that the public can understand the limits and assumptions of an estimate and better understand what people will actually see as the project proceeds.

We believe CEVP will improve everyone's ability to work together on a regional proposal leading to reasonable expectations about what can be delivered from new taxes. It will also improve accountability for the public agencies delivering the projects.

### The CEVP Summaries

CEVP summaries for each mega-project are attached with options for potential project phasing and staging.

Each project's CEVP summary reflects the unique features of a separate project. But all of the summaries share the following points:

- **Project cost estimates are stated in dollar ranges, not as single numbers.**  
This reflects the limits of estimating precision at the planning stage when crucial decisions are yet to be made and the specific risks cannot be exactly costed.
- **Risk considerations specific to each project are identified and described** so that specific risk issues can be foreseen, discussed, and evaluated by the public as the project moves forward.

#### What A CEVP Summary Shows

- Project description and benefits
- Schedule assumptions to adjust estimates to "mid-point of construction" dates for inflation
- Project cost probability ranges at current state of design
- Major risk factors and unknowns to which cost estimates are subject.

Summaries have been provided for "full project implementation" and also for scenarios where parts of projects could be undertaken within an overall regional plan. These scenarios have been selected from many possibilities that decision makers could choose.

CEVP provide backup detail for the conclusions stated in the summaries.

- **Likelihood of project construction schedules have been taken into account** and schedule-based adjustments made to the estimates to reflect the smaller purchasing power of dollars to be spent on construction several years in the future.

CEVP is still being developed. The CEVP summaries are not a warranty that the estimates are perfect, for it is true that you only know the final costs of a project when the project is finally completed. CEVP cannot change the fact that it is very early in the project development process for many of these major projects. There are still many unknowns. But risk areas that could drive up project costs can be communicated fairly to the public. In addition, the early identification of a risk area creates management opportunities to minimize the potential of project costs associated with some of those risk areas.

# SR 520 Trans-Lake Washington Project (Seattle to Redmond, 4-Lanes)

10 Year-Project in Full

4-Lanes



## Description:

- Rebuilds existing four lane freeway between Seattle and Redmond
- Includes replacement of SR 520 floating bridge, approaches, and Portage Bay bridge
- Adds expanded roadway shoulders and bicycle and pedestrian lanes

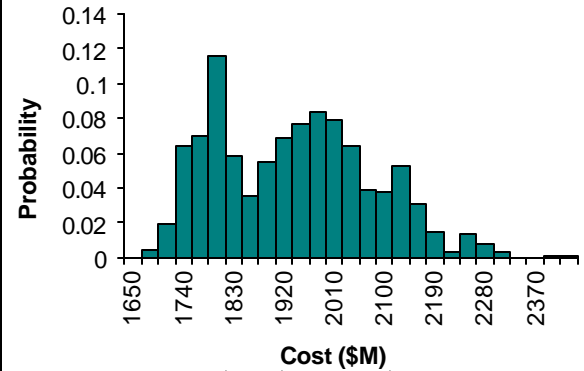
## Schedule:

Begin Construction  
Range: 2005 - 2007

End Construction  
Range: 2014 - 2016

Inflation escalation is  
to 2011, approximate  
midpoint of  
construction

## CEVP Result:



## Project Cost Range

There is a 10% chance the cost is less than \$ 1.8 Billion

There is a 50% chance the cost is less than \$ 1.9 Billion

There is a 90% chance the cost is less than \$ 2.1 Billion

## Benefits this project would provide:

- Maintains current highway capacity
- Decreases seismic and storm damage risk exposure significantly
- Increases safety and operational reliability with added standard shoulders and lane widths
- Reduces HOV travel times with new SR 520 to I-5 express lanes connection
- Expands commuter choices by increasing vanpools and employer commute reduction programs
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails

## Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria result in more expensive structures.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge result in increased complexity and expense.
- Legal challenges and delays in obtaining environmental permits results in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.

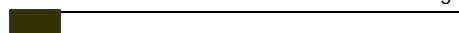
Level of

Project Design:

Low

Medium

High



June 3, 2002



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# SR 520 Trans-Lake Washington Project (Seattle to Redmond, 6-Lanes)

10 Year-Project in Full

6-lanes



## Description:

- Reconstructs and expands SR 520 to six lanes between Seattle and Redmond (adds one HOV/bus rapid transit lane each direction)
- Replaces SR 520 floating bridge, approaches, and Portage Bay bridge
- Adds expanded roadway shoulders, bicycle and pedestrian lanes
- Includes five 300-500-foot lidded sections of freeway

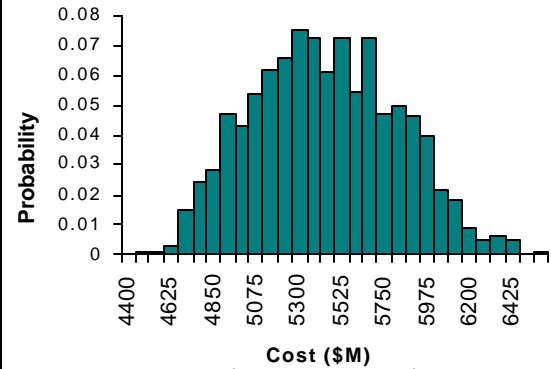
## Schedule:

Begin Construction  
Range: 2005 - 2007

End Construction  
Range: 2014 - 2016

Inflation escalation is  
to 2011, approximate  
midpoint of  
construction

## CEVP Result:



## Project Cost Range

There is a 10% chance the cost is less than \$ 4.9 Billion

There is a 50% chance the cost is less than \$ 5.4 Billion

There is a 90% chance the cost is less than \$ 5.9 Billion

## Benefits this project would provide:

- Expands current highway capacity by adding an HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108<sup>th</sup> NE, 31<sup>st</sup>, and I-405
- Improves freeway flow and improves safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff quality
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84<sup>th</sup> Ave. NE, and 92<sup>nd</sup> Ave. NE southbound I-5 Ship Canal weave
- Addresses southbound I-5 Mercer weave

## Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits result in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.

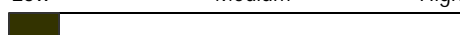
## Level of

## Project Design:

Low

Medium

High



June 3, 2002



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# SR 520 Trans-Lake Washington Project (Seattle to Redmond, 8-Lanes)

10 Year-Project in Full

8-Lanes



## Description:

- Reconnects and expands SR 520 to eight lanes between Seattle and Redmond (adds one general purpose and one HOV/bus rapid transit lane in each direction)
- Replaces SR 520 floating bridge, approaches, and Portage Bay bridge
- Adds expanded roadway shoulders and bicycle and pedestrian lanes
- Includes five 300-500-foot lidded sections of freeway

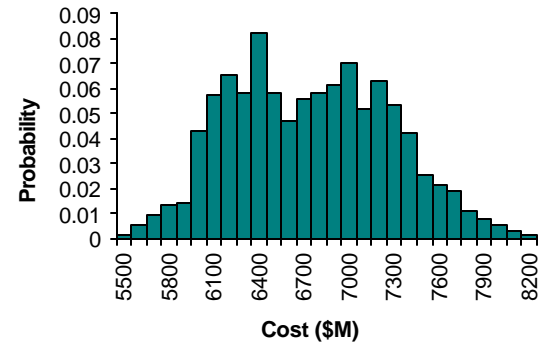
## Schedule:

Begin Construction  
Range: 2005 - 2008

End Construction  
Range: 2016 - 2018

Inflation escalation is  
to 2011, approximate  
midpoint of  
construction

## CEVP Result:



**Project Cost Range** There is a 10% chance the cost is less than \$ 6.0 Billion

There is a 50% chance the cost is less than \$ 6.7 Billion

There is a 90% chance the cost is less than \$ 7.4 Billion

## Benefits this project would provide:

- Expands highway capacity by adding one general purpose and one HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases potential seismic and storm damage risk
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
- Improves freeway flow and improve safety with removal of traffic weaves at SR 520/I-405 interchange
- Addresses southbound I-5 Ship Canal weave and southbound I-5 Mercer weave
- Adds noise walls and improves water runoff management
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Reduces the number of cars driven during rush hour through travel demand management strategies such as expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with 300-500-foot lids at I-5, Montlake, Evergreen Pt. Rd., 84<sup>th</sup> Ave. NE, and 92<sup>nd</sup> Ave. NE

## Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges occurs before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits results in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.
- Potential conflicts with Sound Transit LINK construction at Pacific Street could result in project delay.
- I-405/SR 520 interchange design is complex and difficult to construct, which could increase time and cost.

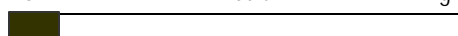
## Level of

## Project Design:

Low

Medium

High



June 3, 2002



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# SR 520 Trans-Lake Washington Project (Seattle to Medina, 6-Lanes) Phasing Option

10 Year-Project in Part

6-lanes



## Description:

- Expands SR 520 to six lanes
- Replaces SR 520 floating bridge, Portage Bay bridge, and approaches from east of Montlake Blvd. to 80<sup>th</sup> Ave. (one HOV/bus rapid transit lane in each direction)
- Adds expanded roadway shoulders and bicycle and pedestrian lanes
- Includes one 300-500-foot lidded section of freeway

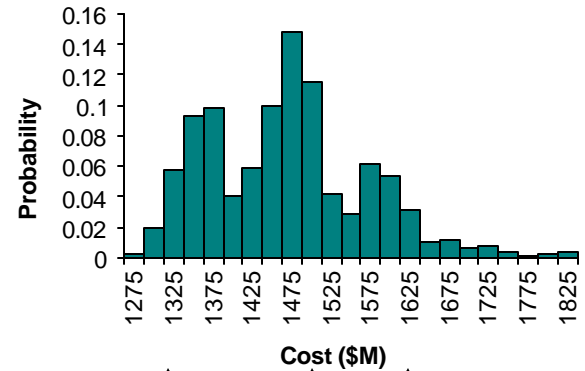
## Schedule:

Begin Construction  
Range: 2005 - 2007

End Construction  
Range: 2015 - 2017

Inflation escalation is  
to 2011, approximate  
midpoint of  
construction

## CEVP Result:



## Project Cost Range

There is a 10% chance the cost is less than \$ 1.3 Billion

There is a 50% chance the cost is less than \$ 1.5 Billion

There is a 90% chance the cost is less than \$ 1.6 Billion

## Benefits this project would provide:

- Extends westbound HOV lane across lake to Montlake Blvd.
- Provides HOV/bus rapid transit bypass lane for eastbound traffic across lake
- Expands current highway capacity by adding HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31st, and I-405
- Improves freeway flow and improve safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff management
- Improves environmental quality by combining ramps in Arboretum area, reducing water pollution from stormwater, and adding noise walls
- Creates a new link for bicycles and pedestrians across Lake Washington and to existing trails
- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
- Reconnects neighborhoods with a 300-500-foot lid at Evergreen Pt. Rd.
- Addresses southbound I-5 Ship Canal weave and southbound I-5 Mercer weave

## Risk issues that could impact project cost or schedule:

- Changes to national seismic design criteria increase structure costs.
- Limited number of contractors are qualified and available to pursue a project this large, increasing contract costs and project delays.
- Catastrophic failure of floating and fixed bridges before replacement, which results in a more expensive emergency replacement.
- Changes to environmental regulations increase project time and cost.
- Special stormwater treatment facilities for the floating bridge increase complexity and expense.
- Legal challenges and delays in obtaining environmental permits result in project delay.
- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increase time to complete project.
- Delays in right-of-way purchase results in later construction start and project cost increases.

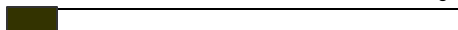
## Level of

## Project Design:

Low

Medium

High



June 3, 2002



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# SR 520 Trans-Lake Washington Project (Seattle to Medina, 8-Lanes) Phasing Option

10 Year-Project in Part

8-Lanes



## Description:

- Expands SR 520 to eight lanes
- Replaces SR 520 floating bridge, Portage Bay bridge, and approaches from east of Montlake Blvd. to 80th Ave. (one HOV/bus rapid transit lane in each direction)
- Adds expanded roadway shoulders and bicycle and pedestrian lanes
- Includes one 300-500-foot lidded section of freeway

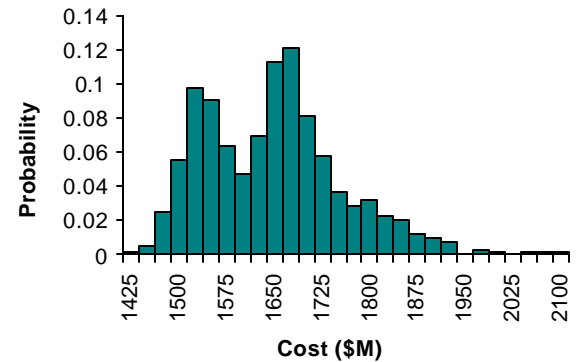
## Schedule:

Begin Construction  
Range: 2005 - 2008

End Construction  
Range: 2016 - 2018

Inflation escalation is to 2012, approximate midpoint of construction

## CEVP Result:



## Project Cost Range

There is a 10% chance the cost is less than \$ 1.5 Billion

There is a 50% chance the cost is less than \$ 1.6 Billion

There is a 90% chance the cost is less than \$1.8 Billion

## Benefits this project would provide:

- Extends westbound HOV lane across lake to Montlake Blvd.
- Provides HOV/bus rapid transit bypass lane for eastbound traffic across lake
- Expands current highway capacity by adding HOV/bus rapid transit lane in each direction
- Increases safety and reliability with added standard shoulders and lane widths
- Decreases seismic and storm damage risk exposure significantly
- Improves speed and reliability of transit and HOV through direct access, dedicated lanes, and better freeway connections at I-5, University of Washington, 108th NE, 31<sup>st</sup>, and I-405
- Improves freeway flow and improves safety with removal of traffic weaves at SR 520/I-405 interchange
- Adds noise walls and improves water runoff management
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- Expands commuter choices by expanding the vanpool fleet and expanding employer commute trip reduction programs
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- Early stage of project development increases project scope uncertainty.
- Restrictions on when work in and around water can occur increases time to complete project.
- Delays in right-of-way purchase results in later construction start and project cost increases.

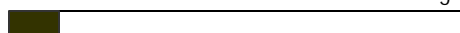
## Level of

## Project Design:

Low

Medium

High



June 3, 2002



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